Accession No. 408938-05

DATA EVALUATION RECORD

1. **CHEMICAL:** Sulfosate

2. **TEST MATERIAL:** SC-0224 4LC-E; 39.9% a.i.
Lot No. WFK-0501; ~~Sample purity not specified~~

3. **STUDY TYPE:** Static Acute Toxicity Test. Species Tested: Rainbow trout, (Salmo gairdneri)

4. **CITATION:** Bowman, J.H. (1987) Acute Toxicity of SC-0224 4LC-E to Rainbow Trout (Salmo gairdneri), ABC Study No. 35638. Prepared by Analytical Bio-Chemistry Laboratories, Inc., Columbia, Missouri; submitted by Stauffer Chemical Co., Richmond, Calif.; Accession No. 408938-05.

5. **REVIEWED BY:**

Kimberly D. Rhodes
Aquatic Toxicologist
Hunter/ESE

Signature: Kimberly D. Rhodes
Date: 01/09/89

6. **APPROVED BY:**

Prapimpan Kosalwat, Ph.D.
Staff Toxicologist
KBN Engineering and
Applied Sciences, Inc.

Signature: P. Kosalwat
Date: January 11, 1989.

Henry T. Craven
Supervisor, EEB/HED
USEPA

Signature: Henry T. Craven
Date: 1/30/89

7. **CONCLUSIONS:** This study appears scientifically sound, ~~but~~ and would ~~does not~~ fulfill the Guideline requirements for a 96-hour/ with this formulation. static acute study for a coldwater fish species. The 96-hour LC50 based upon nominal concentrations of SC-0224 4LC-E to rainbow trout (Salmo gairdneri) was 603 mg/L, which classifies it as practically non-toxic to rainbow trout. The NOEC was determined to be 320 mg/L after 96 hours.

8. **RECOMMENDATIONS:** N/A

9. **BACKGROUND:**

10. **DISCUSSION OF INDIVIDUAL TESTS:** N/A

11. **MATERIALS AND METHODS:**

A. **Test Animals:** Rainbow trout (Salmo gairdneri) used in this test were obtained from a commercial supplier in California and were acclimated to the dilution water and test temperature and held without food for 48-96 hours prior to testing. All test fish were held in culture tanks on a 16-hour daylight photoperiod and observed for at least fourteen days prior to testing. The rainbow trout used for this experiment had a mean weight of 0.82 (±0.23) grams and a mean standard length of 39 (±3.3) millimeters. The chamber loading biomass was 0.55 grams/liter. Fish received a standard commercial fish food occasionally supplemented with brine shrimp nauplii (Artemia sp.) daily until 48-96 hours prior to testing.

B. **Test System:** The test was conducted in five-gallon glass vessels containing 15 L of soft reconstituted water. The reconstituted water was composed of 48 mg $NaHCO_3$, 30 mg $CaSO_4 \cdot 2H_2O$, 30 mg $MgSO_4$, and 2 mg KCL per liter of deionized water. The temperature was maintained by a water bath at 12 ± 1°C. Six concentrations and a control were used to determine the toxicity of SC-0224 4LC-E to rainbow trout.

The water parameters of the dilution water were a total hardness of 42 mg/L as $CaCO_3$, a total alkalinity of 32 mg/L as $CaCO_3$, and an initial pH of 7.5. The 0-hour measured control water parameters of this dilution water were dissolved oxygen 9.8 mg/L and pH 7.2.

C. **Dosage:** 96-hour static acute test.

D. **Design:** A 96-hour range-finding and definitive test were conducted. The range-finding test concentrations were set at 1.0, 10, and 100 mg/L. Based on the results of preliminary testing, six concentrations of the test compound, ranging in a logarithmic series from 56 to 1000 mg/L were tested. Ten fish added per chamber within 30 minutes following preparation of nominal concentrations. Treatments were not duplicated. A control and nominal SC-0224 4LC-E concentrations of 56, 100, 180, 320, 560 and 1000 mg/L were maintained. All concentrations were observed once every 24 hours for mortality and abnormal effects.

E. **Statistics:** The computer program developed by Stephan et al. was used to calculate the LC50 values.

12. **REPORTED RESULTS**: "Nominal test concentrations, mortality rates, and water quality data are presented in Table 3 (attached)." The 24-, 48- and 96-hour LC50 values for nominal concentrations of SC-0224 4LC-E were 750, 750 and 600 mg/L, respectively. The no-effect concentration based on mortality and abnormal effects was 320 mg/L after 96 hours. "Upon dosing and mixing the test solutions, a surface foam was created." The dissolved oxygen concentrations ranged from 5.3 to 9.8 mg/L (49 to 92% saturation at 12 and 13°C, respectively) during the test. "This drop was generally associated with increasing concentrations of the test material."

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES**: The 96-hour LC50 value for SC-0224 4LC-E based upon nominal concentrations was estimated to be 600 mg/L with a 95 percent confidence interval of 320 to 1000. The NOEC (No- Observed-Effect Concentration) was 320 mg/L after 96-hours.

    The study was conducted following the intent of the Good Laboratory Practice Regulations and the final report was reviewed by Analytical Bio-Chemistry Laboratories' Quality Assurance Unit. A Quality Assurance Statement was included and signed by the Quality Assurance Officer.

14. **REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS**:

    A. **Test Procedure**: The test procedures were generally in accordance with protocols recommended by the Guidelines, but deviated from the SEP as follows:

        - The test material was not clearly identified as to exact purity.
        - Six hour temperature measurements were not recorded as required by the SEP for tests conducted in a water bath.
        - The SEP states that each designated treatment group should be exposed to a concentration of toxicant that is at least 60% of the next highest concentration. Each designated treatment group for the test was only 56% of the next highest concentration.

    B. **Statistical Analysis**: The reviewer used the Toxanal computer program to calculate the LC50 values. These calculations are attached. The binomial test provides a 96-hour LC50 value of 603 mg/L with a 95 percent confidence interval of 320 to 1000 mg/L, which is similar to that reported by the author.

C. **Discussion/Results:** The study results appear to be scientifically valid, however, the lack of test substance purity does not permit final evaluation of the substance's toxicity to rainbow trout. The 96-hour LC50 value based upon nominal concentrations was estimated to be 600 mg/L. Therefore, SC-0224 4LC-E is classified as practically non-toxic to rainbow trout (Salmo gairdneri).

D. **Adequacy of the Study:**

(1) **Classification:** Supplemental Core, for this formulation

(2) **Rationale:** Purity of test substance not provided.

(3) **Repairability:** Yes, submit purity of test substance.

15. **COMPLETION OF ONE-LINER FOR STUDY:** Yes, 01-09-89.

- 39.9% a.i., according to proposed label
- Confidential Statement of Formula also on file with Agency

No. _____ Chemical Name sulfosate (SC0224 ~~Technical~~ Chemical Class practically non-toxic Page ___ of ___

Study/Species/Lab/ Succession	Chemical % a.i.	Results	Reviewer/ Date	Validation Status
14-Day Single Dose Oral LD_{50}		LD50 = mg/kg (95% C.L.) Contr. Mort.(%)=		
Species	____	Slope= # Animals/Level= Age(Days)= Sex =	____	____
Lab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		
14-Day Single Dose Oral LD_{50}		LD50 = mg/kg (95% C.L.) Contr. Mort.(%)=		
Species	____	Slope= # Animals/Level= Age(Days)= Sex =	____	____
Lab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
Acc.		Comments:		
8-Day Dietary LC_{50}		LC50 = ppm (95% C.L.) Contr. Mort.(%)=		
Species		Slope= # Animals/Level= Age(Days)= Sex =		
Lab	____	8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )	____	____
Acc.		Comments:		
8-Day Dietary LC_{50}		LC50 = ppm (95% C.L.) Contr. Mort.(%)=		
Species		Slope= # Animals/Level= Age(Days)= Sex =		
Lab	____	8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )	____	____
Acc.		Comments:		
8-Day Dietary LC_{50}		LC50 = ppm (95% C.L.) Contr. Mort.(%)= Sol. Contr. Mort.(%)=		
Species		Slope= # Animals/Level= Temperature =		
Lab	____	96-Hour Dose Level ppm /(%Mortality) ( ), ( ), ( ), ( ), ( )	____	____
Acc		Comments:		
96-Hour LC_{50}		LC50 = 603 ppm (95% C.L. 320-1000) Con. Mor(%)= 0 Sol. Con. Mor.(%)= N/A		
Species Salmo gairdneri		Slope= not given Animals/Level= 10 Temp.= 12±1°C	1/9/89 K.R.	~~Suppl~~ Core, for 4LC-E formulation (39.9 % a.i)
Lab Analytical Bio Chemistry Laboratories	not specified	96-Hour Dose Level ppm/(%Mortality) 56 (0), 100 (0), 180 (0), 320 (0), 560 (40) 1000 (100)		
Acc. 408937-04		Comments: Based on nominal concentrations		
96-Hour LC_{50}		LC50 = ppm (95% C.L.) Con. Mort.(%)= Sol. Con. Mort.(%)=		
Species		Slope= # Animals/Level= Temp.=		
Lab	____	96-Hour Dose Level ppm /(%Mortality) ( ), ( ), ( ), ( ), ( )	____	____
Acc.		Comments:		

4LC-E Formulated product

KIMBERLY RHODES CD-0224 ~~TECHNICAL~~ SALMO GAIRDNERI 01-04-88

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
1000	10	10	100	9.765625E-02
560	10	4	40	37.69531
320	10	0	0	9.765625E-02
[illegible]	[illegible]	0	0	9.765625E-02
[illegible]	[illegible]	0	0	9.765625E-02
[illegible]	[illegible]	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 320 AND 1000 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 600.7239

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

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